

CARNEGIE INSTITUTION OF WASHINGTON

1530 P STREET, NORTHWEST
WASHINGTON, D. C. 20005-1910

OFFICE OF THE PRESIDENT

VIA TELEFAX

October 26, 1989

Dr. Alison Stewart
Editor
Trends in Genetics
Elsevier Trends Journals
68 Hills Road
Cambridge CB2 1LA
U.K.

Dear Dr. Stewart:

The LINES Workshop was very good indeed. We had about 65 people and over 40 talks. There was good discussion, even heated at times. Everyone seems to have learned a good bit.

There was a good bit of new direction in some of the work, particularly on expression of LINE elements. Consequently, Dr. Yoshiyuki Sakaki and Dr. Paolo DiNocera, two members of the Organizing Committee, decided to write up a report for submission to TIG. I am mailing them copies of your letter to me and they should be in touch with you directly. Overlap with the report on the EMBO meeting is minimal, as there is very little in the Comment by Hull and Will about LINE elements.

In fact, the Hull and Will piece suggests that they were unaware of the recent work on LINE elements. I conclude this from the proposed nomenclature, which is problematic. My reasons are given below, and if you think it appropriate, this material could be published as a letter to TIG.

Two comments should be made about the proposed nomenclature. First, the division into viral and nonviral retroelements assumes that none of the elements now classified as nonviral will turn out to have an extracellular, infectious phase. That may turn out to be erroneous. Studies on the distribution of these elements may, in some instances, suggest horizontal transfer among species. Perhaps in some as yet unknown way some of the elements can be viable as extracellular, infectious agents.

Second, the assignment of elements in the subgroups of nonviral retroelements does not take into account the critical differences among the elements assigned to group II. SINES appear, in known instances, to be processed pseudogenes of class

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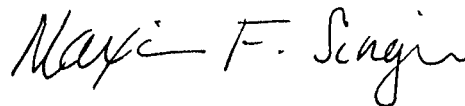
III genes encoding RNAs (e.g., tRNAs and 7SL RNA). LINEs, mitochondrial introns, and mitochondrial plasmids are a mix of things, but have in common that they encode, or are likely to encode, functional reverse transcriptases. These enzymes are believed to be essential for transposition. Thus, LINEs, mitochondrial introns, and mitochondrial plasmids appear to be "active" elements in that they encode functions required for reverse transcription and transposition. In contrast, there is no indication that SINEs encode any proteins. I would suggest reserving the term 'retroposon' for passive elements, whose reverse transcription is likely to require an enzyme encoded by some other part of the genome.....the SINEs. The LINEs, and mitochondrial elements could be given a class of their own, or could come under I as non-LTR retrotransposons. In one case, an integrase function has been demonstrated for a LINE-like element, R2Bm of Bombyx mori.

I am also puzzled by definition in the text of class III, Retrons. As stated, the definition fits LINE-like elements; as far as is known (the mitochondrial plasmids), they use unconventional mechanisms for reverse transcription, they have no known extracellular phase, and they do not have LTRs. Yet, the msDNA stands alone in this class.

Perhaps the November issue of TIG could make clear that the proposal is being offered for comment. Then, after an exchange of views, a more generally useful classification could be published. As it stands, I can not agree with Hull and Will's statement that their nomenclature should be helpful. Contrarily, things may get even more confusing.

With kind regards,

Sincerely,



Maxine F. Singer

MFS:sdb

cc: Dr. Yoshiyuki Sakaki
Dr. Paolo DiNocera
Dr. David Finnegan